

IN THE CLAIMS:

Kindly cancel non-elected claims 18-22 and 29 without prejudice or admission, and amend claims 8, 13, 17, 23 and 27 as shown in the following listing of claims, which replaces all previous versions and listings of claims.

1. - 7. (canceled).

8. (currently amended) A magnetic bearing apparatus comprising: a rotor; a motor having stator coils for generating a rotary magnetic field for rotating the rotor; magnetic supporting coils for producing a magnetic force for magnetically supporting the rotor in a radial direction thereof; a radial position sensor for detecting movement of the rotor in the radial direction thereof in the vicinity of the radial position sensor; composite magnetic force inferring means for inferring composite vectors of the magnetic force affecting the rotor based on the rotary magnetic field and the radial position of the rotor; and magnetic support adjustment means for adjusting the magnetic force produced by the magnetic supporting coils to cancel ~~offset~~ the composite vectors of the magnetic force in the motor.

9. (previously presented) A magnetic bearing apparatus according to claim 8; wherein the rotor is supported

by the magnetic supporting coils at a position at which an axis of rotation of the rotor passes through a gravitational center of the rotor.

10. (previously presented) A magnetic bearing apparatus according to claim 9; wherein the composite magnetic force inferring means comprises a magnetic flux detector for detecting a magnetic flux existing in an air gap between a magnetic pole of the rotor and the stator coils, and second inferring means for inferring the composite vectors of the magnetic force affecting the rotor from the magnetic flux detected by the magnetic flux detector.

11. (previously presented) A magnetic bearing apparatus according to claim 10; wherein the motor is a brushless DC motor comprised of a plurality of magnetic poles fixed to the rotor and a plurality of coils wound around the respective magnetic poles.

12. (previously presented) A magnetic bearing apparatus according to claim 8; wherein the motor is a brushless DC motor comprised of a plurality of magnetic poles fixed to the rotor and a plurality of coils wound around the respective magnetic poles.

13. (currently amended) A magnetic bearing apparatus according to claim 12; further comprising a ~~radial position sensor for detecting movement of the rotor in the radial direction thereof in the vicinity of the radial position sensor;~~ and inferring means for inferring movement of the rotor in the radial direction in the vicinity of the motor based on a positional relationship between the radial position sensor and the motor and an amount of movement of the rotor detected by the radial position sensor; and wherein the composite magnetic force inferring means comprises calculating means for calculating composite vectors of the magnetic force affecting the rotor on the basis of a rotational angle of magnetic poles of the rotor, a magnetic field generated by the stator coils of the motor, and the movement of the rotor in the radial direction in the vicinity of the motor inferred by the inferring means.

14. (previously presented) A magnetic bearing apparatus according to claim 13; wherein the calculating means calculates the composite vectors of the magnetic force affecting the rotor on the basis of a database of composite vectors of the magnetic force affecting the rotor and a relationship thereof to the radial movement of the rotor, the rotational angle of the magnetic poles of the rotor, and the magnetic field generated by the stator coils of the motor.

15. (canceled).

16. (canceled).

17. (currently amended) A magnetic bearing apparatus according to claim 8; wherein the magnetic support adjustment means adjusts the magnetic force produced by the supporting coils to reduce vibration of the motor caused by unbalance in a magnetic force generated by the motor and represented by the composite vectors.

18. - 22. (canceled).

23. (currently amended) A magnetic bearing apparatus comprising: a rotor; a motor having stator coils for generating a rotary magnetic field for rotating the rotor; magnetic supporting coils for producing a magnetic force for magnetically supporting the rotor in a radial direction thereof; a radial position sensor for detecting radial movement of the rotor in the vicinity of the radial position sensor; composite magnetic force determining means for determining composite vectors of a magnetic force affecting the rotor based on the rotary magnetic field and the radial position of the rotor; and magnetic support adjusting means for adjusting the magnetic force produced by the magnetic supporting coils to cancel ~~offset for~~ unbalance in the

magnetic force affecting the rotor and represented by the composite vectors of the magnetic force, to thereby reduce vibration of the rotor.

24. (previously presented) A magnetic bearing apparatus according to claim 23; wherein the composite magnetic force determining means comprises a magnetic flux detector for detecting a magnetic flux in an air gap between a magnetic pole of the motor and the stator coils, and means for determining the composite vectors of the magnetic force affecting the rotor based upon the magnetic flux detected by the magnetic flux detector.

25. (previously presented) A magnetic bearing apparatus according to claim 24; wherein the motor is a brushless DC motor comprised of a plurality of magnetic poles fixed to the rotor and the plurality of stator coils wound around the magnetic poles.

26. (previously presented) A magnetic bearing apparatus according to claim 23; wherein the motor is a brushless DC motor comprised of a plurality of magnetic poles fixed to the rotor and the plurality of stator coils wound around the respective magnetic poles.

27. (currently amended) A magnetic bearing apparatus according to claim 23; wherein the composite magnetic force determining means comprises ~~a radial position sensor for detecting radial movement of the rotor in the vicinity of the radial position sensor,~~ means for detecting radial movement of the rotor in the vicinity of the motor based on an output of the radial position sensor and a positional relationship between the radial position sensor and the motor, and calculating means for calculating the composite vectors of the magnetic force affecting the rotor on the basis of a rotational angle of magnetic poles of the rotor, a magnetic field generated by the stator coils, and the radial movement of the rotor in the vicinity of the motor.

28. (previously presented) A magnetic bearing apparatus according to claim 27; wherein the calculating means calculates the composite vectors of the magnetic force affecting the rotor on the basis of a database of from which the composite vectors affecting the rotor are obtained based on stored data showing a relationship between the composite vectors affecting the rotor, radial movement of the rotor, a rotational angle of the magnetic poles of the rotor, and the magnetic field generated by the stator coils of the motor.

29. (canceled).